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[G-8]

[G-8] Assessing The Impact of the
Lakeshore Commuter Rail Service On
Real Estate Values and Land Use.

Prepared by
R.A. Robinson
for
Metropolitan Toronto
THE METROPOLITAN TORONTO AND REGION
TRANSPORTATION STUDY.

[General publications]

November 1966.

I N D E X

- I. Introduction
- II. Objectives
- III. Methodology
- IV. Form and Content at Municipal Records
- V. Analytical Approach
- VI. Information Requirements
- VII. Data Gathering Procedures

Exhibits available on Master Copy
in Study office.

ASSESSING THE IMPACT OF THE
LAKESHORE COMMUTER RAIL SERVICE ON
REAL ESTATE VALUES AND LAND USE

I. INTRODUCTION

With the commencement of the Lakeshore Commuter Rail Service scheduled for early 1967, it has been proposed that a study be designed by MTARTS to help assess the impact of this transportation facility on real estate values and land use along the rail corridor (the rail service will extend from Hamilton in the west, to Pickering in the east). In tackling this assignment, it was decided, as a first step, to conduct a survey of the raw data already in existence and readily accessible to MTARTS which might be useful to the study. If this survey indicated useful data were available, a program would then be designed for collecting the data.

Accordingly, this report details the available data found to be relevant to the study and recommends a programme for its collection. In addition, since the gathering of raw data assumes the existence of some kind of analytical framework in which the data is to be used, the report also recommends an analytical approach for the study.

The analytical approach recommended herein, is based on a highway impact study with very similar objectives conducted by the Texas Transportation Institute (Restudy of Changes in Land Value, Land Use and Business Activity Along a Section of Highway 35 in Temple, Texas 1964). Of the various research studies dealing with the impact of a transportation facility, this particular study seemed to be as relevant as any, and while it is recognized that the transportation facility being studied here is a rail service rather than a

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I. INTRODUCTION

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The analytical approach recommended herein, is based on a highway impact study with very similar objectives conducted by the Texas Transportation Institute (Study of Changes in Land Value, Land Use and Business Activity Along a Section of Highway 35 in Temple, Texas 1964). Other various research studies dealing with the impact of a transportation facility, this particular study seemed to be as relevant as any, and while it is recognized that the transportation facility being studied here is a rail service rather than a highway, the similarities between the two modes of transportation are such that the study of the highway facility is a reasonable basis for the study of the rail facility.

highway, it is felt that the essential difference is really only one of impact distribution rather than kind of impact.

II. OBJECTIVES

The objectives of this study are as follows:

1. (a) To measure any changes in land values that have occurred during a specific period of time within given areas near the Lakeshore Commuter Rail Service.
(b) To determine the extent to which these changes might be attributed to, or associated with, the construction and operation of the Service.
2. To determine the changes in the pattern and intensity of land use that may have occurred within these same areas, and to attempt to explain these changes in terms of influence by the Commuter Rail Service.
3. To determine the effect of the Commuter Rail Service on the character of households in the areas served by it.

III. METHODOLOGY

1. It was agreed at a meeting attended by P.E. Wade, W.B. Ganong, and R.A. Robinson of MTARTS, and J.I. Stewart of the Division of Town and Regional Planning, School of Architecture, University of Toronto, that a useful first step would be to investigate the types of data available in municipal records which might be of value to this project. Accordingly, Mr. Robinson began a pilot data collection program in the Oakville Municipal Office in an effort to determine:

- a) The types of data which might be gathered.
 - b) The sources which might be utilized.
 - c) The time and costs likely to be entailed.
2. After a preliminary survey of municipal records in Oakville, a second meeting of the above group was held during which Mr. Robinson reported on the data available (Exhibit 1). It was then decided that Mr. Robinson should return to Oakville and actually go through the process of gathering data in an effort to uncover any problems associated with the task. Specifically, Mr. Robinson was requested to go through the steps involved in estimating the market value of real estate in each of a number of data collection zones which had been established for a research project called the Home Interview Survey.
3. This data gathering trial resulted in a step by step procedure for assembling the necessary real estate data. At the same time a procedure was developed for collecting data relating to land use, household and other characteristics.
4. Mr. Robinson then visited all the other municipalities along the Commuter Rail corridor (with the exception of Burlington and Hamilton) to see if there were any major deviations from Oakville in the records and data which might be available for use in the project.
5. This report was then written detailing what data was available and recommending how it might be profitably used.

IV. FORM AND CONTENT OF AVAILABLE DATA

1. Available Municipal Records

In deciding which municipal documents to use as data sources the following criteria were used:

- a) Relevance of the data to the objectives of the project.
- b) Accuracy of the data.
- c) Historical period for which data was available (data had to be available back to at least 1959).
- d) Accessibility of the data.

Applying these criteria, the following documents were selected as basic data sources for each municipality.

- a) Assessment Roll.
- b) Real Estate Sales Records
- c) Population Statistics.
- d) Land use Maps.
- e) Building Permits.

The appendix to this report details the specific information available from each municipality.

2. Assessment Roll

This is a document which each municipality is required to maintain under the Assessment Act and which is completely open to the public. The assessment roll is kept in the office of the municipal clerk or the municipal assessment department and contains the assessed value of land and buildings for each property in the municipality. In addition the assessment roll

in the majority of municipalities identifies each property according to a land use category (the exception is Toronto Township) and provides certain pieces of information regarding household characteristics. In each municipality the assessment roll is divided into books each book representing one ward.

3. Real Estate Sales Records

Each municipality maintains records of real estate sales which it receives from the county registry office for use, among other things, in checking the validity of property assessments. The information contained in these documents is not open to the general public but may be released at the discretion of the municipal assessment commissioner (or equivalent). Municipal real estate records contain the selling price of each piece of property sold in the municipality and are maintained on a continuing basis. The information is normally received from the county registry office in one of two forms; either as a photostat copy of each deed of sale on which is recorded the selling price of the property, or as a summary sheet listing all property sales for a certain period of time (e.g. a month).

4. Population Statistics

Every year a population census is taken in a municipality by the assessment department giving the number of residents and age breakdown for each dwelling unit. Usually this data is aggregated into wards and placed on file by the municipality, after which individual dwelling unit data are discarded. However, if needed for analysis,

provision could probably be made for retaining the individual dwelling unit data. Population data is also available from the assessment roll in the form of the number of residents per dwelling unit. However, no age breakdown is given.

5. Land Use Maps

Two sets of land use maps are available which are probably all that would be needed for the purpose of this study. The first of these are the land use maps for the Metropolitan Toronto Planning Board. These maps which include, in addition to Metropolitan Toronto, all land in the townships of Toronto, Pickering, Toronto Gore, Vaughan and Markham (the last three townships are, beyond the geographic scope of this study). The second set of maps covers the Town of Oakville and are prepared by the Oakville Planning Department. The combined Metro Toronto Planning Area and Oakville maps take in the entire area likely to be influenced by the Commuter Rail Service, with the exception of the Burlington and Hamilton areas. However, it is expected that the impact of the Commuter Rail Service on these two areas will be limited.

6. Building Permits

Each building permit application is kept on file in the office at the municipal building inspector. This document gives the name and address of the applicant, the location of the property in terms of both lot and plan number and civic address, and the expected building cost involved. Normally, the cost information is deliberately understated in an effort to obtain a low assessment.

V. ANALYTICAL APPROACH

1. Impact on Real Estate Values

The ideal analytical approach for this part of the study would be to compare changes in real estate values in the areas influenced by the Commuter Rail Service against another group of areas, identical in every respect, but beyond the influence of the Commuter Rail Service (i.e. a group of control areas). If, in fact, the two groups of areas were identical, except for the presence in the one case of the Commuter Rail Service, then any differences in real estate values could logically be attributed to the facility. Obviously, such ideal conditions are never found in real life, and when an attempt is made to employ this analytical approach to measure the impact of the Commuter Rail Service, it is virtually impossible to find areas sufficiently similar to the areas with the influence of the Commuter Rail Service, which can be used as controls. Just as an example, for purpose of analysis it is not really wise to compare a town like Oakville, which will have the Commuter Rail Service against a control area such as Brampton, which will not have the service, since the tremendous building development which has occurred around Brampton in recent years may well introduce serious biases into such a comparison. Nor, obviously, could Oakville, which is urbanized, ever be compared to a rural control area. This difficulty is compounded by the fact that certain stops along the rail corridor will be exposed to factors, other than the Commuter Rail Service, that are likely to have a significant effect on real estate values. For example, a wave of apartment construction is scheduled to begin in Port Credit in 1967. This

activity has been prompted by a recent revision to the Port Credit zoning by-law which sharply increased the permissible density of apartment buildings. Similarly, the linking of the Don Valley Parkway with Highway 401, which is near completion, will significantly increase the accessibility of the east end of Toronto so that quite apart from the Commuter Rail Service, real estate values may be affected by this factor. Such examples underline the problem of attempting to isolate the effect of the Commuter Rail Service from all other possible causes.

In the absence of a good set of controls against which to compare changes, two alternatives are recommended. The first, and most obvious is to measure real estate values both before and after the installations of the Commuter Rail Service and, on the basis of seasoned judgement, determine the extent to which any observed changes are attributable to the transportation facility. The seasoned judgement factor cannot be emphasized too strongly since any of a number of influences, the Commuter Rail Service being only one, might have been responsible for any changes in real estate values in a particular area. For this reason it is strongly recommended that the interpretation of any data using the before/after approach be entrusted to a person fully acquainted with all the prevailing influences which may have been affecting real estate values. Probably the most reliable source of information on such influences is the Metropolitan Toronto Planning Board.

Confirmation of any conclusions drawn from analysis can be made by actually talking to members of the municipal staff in each study area, particularly members of assessment and planning departments.

A second analytical approach is to divide the catchment area for each station, that is, the area from which the station draws the bulk of its passengers, into two parts, one being an area surrounding the station, and the other being the balance of the catchment area, and then comparing real estate values in each of the two areas. An example of such a division is given in Exhibit 2. This is similar to one of the analytical approaches used by the Texas Transportation Institute in its highway impact studies (i.e. comparing changes in the value of land abutting a highway vs. non-abutting land). The rationale underlying this approach is that if the Commuter Rail Service has any effect at all on real estate values, then those areas immediately surrounding each station could be expected to experience a greater change than those areas further out. In this approach the further out areas serve as a quasi control. As with the before/after approach all interpretations of data should take into account any other prevailing influences which may have had an effect on real estate values. (e.g. a change in a municipality's zoning by-law increasing the permissible density of apartment buildings).

2. Impact on Land Use

The only analytical approach which appears feasible for measuring the impact of the Commuter Rail Service on land use is the before/after approach outlined in the preceding section. The divided catchment area approach is not really practical here since the two divisions are very often not likely to have comparable land use patterns.

3. Impact on Household Characteristics

Both the before/after and divided catchment area approaches could be used for measuring the impact of the commuter rail service on household characteristics. However, it is recommended that only the before/after approach be used since it is difficult to rationalize how any difference in household characteristics could be attributed to station proximity.

4. Geographical Scope of the Study

The geographical scope of the study should be the entire Commuter Rail Service corridor, that is, the area adjacent to the Service and likely to be influenced by it. However, since preliminary indications are that the residents of Hamilton and Burlington will make only limited use of the Service, it seems unnecessary to include the areas surrounding these two stations in the study.

5. Boundaries of Study Areas

In keeping with the analytical approaches mentioned above it is recommended that each study area consist of a station catchment area. Assuming that a survey of passenger origin is conducted after the commencement of the Commuter Rail Service then the catchment areas indicated by the survey should be used as study

areas. However, in the absence of such a survey then the anticipated catchment areas currently being developed by MTARTS could serve as study areas.

Because of the difficulties already mentioned in finding suitable control areas, it is not recommended that any attempt to define control areas beyond catchment areas be made.

When dividing individual catchment areas into two parts for analysis, such a division must necessarily be somewhat arbitrary. Therefore, it is suggested that the area of the portion nearest the station be equal to the area of the portion further out.

6. Analysis Areas

It is recommended that the data for each catchment area be gathered into analysis areas having the same boundaries as the data collection zones in the "914" series (these data collection zones were developed for the Home Interview Survey). The reasons for this recommendation are twofold. First, since these are the same data collection zones being used in other parts of MTARTS, data gathered for the purpose of measuring changes in real estate values, land use, and household characteristics can thus be compared against data gathered for other parts of the Study, if so desired. Secondly, because of their small size, the "914" data collection zones provide complete flexibility as to the aggregations that can be made and thus the inter-area comparisons that are possible. This flexibility is particularly significant in the case of the divided catchment area analytical approach where an inter-area comparison is involved (i.e. the area surrounding

the station vs. the balance of the catchment area), but where no decision has yet been made as to actual catchment division lines. This decision need not be made until the time the actual comparison is made.

In Exhibit 3 are listed the "914" data collection zones actually considered to represent the Commuter Rail corridor, or the area from which the Service will draw its passengers. In this exhibit the data collection zones have also been aggregated into what are called super zones. These represent the combined catchment areas of the corridor.

7. Time Periods

To provide any meaningful information it will probably be necessary to conduct this study over a relatively long period of time (the Texas Transportation Institute study on the impact of Interstate Highway 35 covered the period 1943- to 1961). It is recommended that, as with the Texas Transportation Institute study, measurements be taken over three different time periods.:

- a) A period prior to any knowledge that the Commuter Rail Service was to be installed. Recommended period - mid 1963 to mid 1965.
- b) An organization period covering the time between the announcement of the Commuter Rail Service and its actual commencement. Recommended period - mid 1965 to early 1967.
- c) A post operating period beginning sometime after the Commuter Rail Service is in full operation - Recommended period - starting 4 years after commencement of the Service.

8. Property Identification

Any document found in a municipal office containing data which relates to a specific piece of property (e.g. the price it recently sold for, its assessed value etc.) will give the property's geographic location. Normally, the geographical location is expressed in terms of a lot and plan number, which refers to the building lot number assigned to the property and the registered subdivision plan in which the lot is located. Lot and plan numbers are seldom, if ever, changed and thus serve as an excellent permanent reference for identifying the geographical location of a piece of property. Maps showing the boundaries of each registered subdivision plan and their component building lots are always available in a municipality and are usually found in its planning department

9. Property Identification Index

An essential step in collecting any data for this project referring to specific property (e.g. assessment roll data) will be that of preparing a property identification index for every catchment area, giving the geographic location in terms of the "914" data collection zone into which it falls. To illustrate the need for such an index, assume that a comparison of real estate values in two analysis areas (e.g. two aggregates of "914" data collection zones) is to be made and that the raw data for this comparison comes in the form of a 12 monthly list of property transactions from the county registry office giving the price for which each property was sold and the lot and plan number. Because the individual transactions on this list would not be identified by

data collection zone, the desired inter-area comparison would not be possible. However, through the use of a property identification index, properties can be assigned a data collection zone number and then grouped together into data collection zones. Exhibit 4 suggests a format for a property identification index.

10. Procedure for Developing a Property Identification Index.

- a) Obtain a lot and plan map from the municipality whose data is being gathered.
- b) If the boundaries for each plan are not clearly defined (as will often be the case) have a member of the municipal staff draw in the boundaries, preferably with a brightly colored marking pen.
- c) Superimpose the boundaries of each data collection zone onto the lot and plan map.
- d) Using the map, list the lot and plan numbers falling into each data collection zone.

Exhibit 5 gives an example of a lot and plan map.

In those cases where data relating to a piece of property are identified by civic address instead of a lot and plan number (Metro Toronto assessment rolls) then a street map indicating civic addresses should be used rather than lot and plan map.

VI. INFORMATION REQUIREMENTS

In order to conduct the analysis discussed in the preceding section, it is recommended that the following information be developed.

1. Real Estate Values

An estimate of the market value of:

- a) Single family residential real estate data collection zone.
- b) Multiple family residential real estate by data collection zone.
- c) Agricultural real estate by data collection zone
- d) Commercial real estate by data collection zone
- e) Industrial real estate by municipal ward.*

* A municipal ward is suggested here since a data zone is too small to provide sufficient data on which to base a reliable estimate of real estate value.

2. Land Use

- a) An estimate of the pattern of land use by data collection zone broken down into the following use categories.
 - 1. Residential (urban)
 - 2. Residential (rural)
 - 3. Major Commercial
 - 4. Industrial
 - 5. Major Institutional
 - 6. Public Open Space
 - 7. Private Open Space
 - 8. Transportation and Utilities
 - 9. Agriculture.

The purpose of this study is to investigate the effects of the proposed system on the performance of the system.

2. Methodology

The study was conducted using a controlled experiment.

The results of the experiment are as follows:

The first result is that the proposed system

improved the performance of the system.

The second result is that the proposed system

reduced the error rate of the system.

The third result is that the proposed system

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concluded that the proposed system is effective.

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- b) An estimate of the intensity of land use in terms of:
 - 1. Population/ Acre - for residential areas.
 - 2. Assessed Value of Building/ Acre - for commercial and industrial areas.

- c) Volume of building permits

It is recommended that changes observed in the pattern and intensity of land use be confirmed by measuring changes in the volumes and value of building permits as well. For example, it might be observed that in a particular municipality the portion of land occupied by residential housing had increased over a period in which case a corresponding increase in the volume and value of building permits would confirm the observation. Likewise, it may be observed that the intensity of land use in terms of dollar value and population per acre had increased. A similar increase in the volume and value of building permits would tend to confirm this observation.

3. Household Characteristics

An estimate of the following household characteristics for each data collection zone area:

- a) Breakdown of occupation by head of household.
- b) Number of residents per household.
- c) Age breakdown of residents.

VII. DATA GATHERING PROCEDURES

1. Real Estate Values

a) Approach for Obtaining Real Estate Estimates

The recommended approach for obtaining the desired real estate estimates consists of two steps. The first is to determine, from assessment rolls, the total assessed value of real estate for each data collection zone, broken down by usage category (i.e. single family residential, multiple family residential, commercial etc.) The second step is to adjust these assessed values upwards to their estimated market value by means of a market adjustment factor based on current real estate prices. Thus two intermediate pieces of information are required:

- i) Total assessed value of real estate for each data collection zone broken down by usage category.
- ii) A market adjustment factor for each data collection zone.

b) Procedure for Gathering Real Estate Data

- i) Determining the property assessment for each data collection zone.
 - Refer to the set of assessment roll books for each catchment area (e.g. in the case of Oakville the assessment roll books would be found in the Oakville assessment department).

- For each data collection zone in a catchment area determine the pages in the assessment roll books giving the assessed value of the individual properties in the data collection zone. This step is essentially one of taking the property identification index and translating the lot and plan numbers for each data collection zone into corresponding assessment roll number. It is recommended that this operation be performed with the aid of a member of the municipal assessment department.
- For each data collection zone add up the individual property assessment for each usage category.

A suggested worksheet format for performing these steps is contained in Exhibit 6.

While carrying out the above steps is a major clerical undertaking, it is probably less formidable than would appear at first glance. This is partially due to the fact that lot and plan numbers and their corresponding assessment roll numbers follow a consecutive sequence. For example, the lots in a plan numbered 407 might be designated 407-1, 407-2, 407-3, etc. while their corresponding assessment roll numbers might be 2-113, 2-114, 2-115 etc. As a result, it will very often happen that once the sequence of lot and plan numbers for a data collection zone are known (as per the property identification index) the sequence of corresponding assessment roll numbers can be determined almost immediately. In addition, the sequence of lot and plan numbers are very often quite long, covering several pages of an assessment roll. This means that the matching of individual lot and

plan numbers with assessment roll numbers can be done reasonably quickly. Still further, at the bottom of each assessment roll page is recorded the total assessment of all properties listed on the page. Thus, establishing the assessed value of a sequence of properties is a relatively simple matter since it does not require adding up individual property assessments. Finally one of the municipalities, Oakville, has a special index for its own internal use which already translates each lot and plan number into an assessment roll number.

ii) Developing a Market Adjustment Factor

Having established the total assessment in each data collection zone, the next step is to adjust these values upward to their estimated market value by means of a factor developed as follows:

- Obtain a list of all properties sold in the catchment area together with the prices for which each sold.
- Group the various property sales into their respective data collection zones.
- For each piece of property sold determine its assessed value from the assessment roll.
- Add up the sales values and assessed values for each data collection zone.
- Calculate the ratio of assessed value to sales ratio for each data collection zone.

Where there have been insufficient property transactions in a data collection zone to yield a reliable market adjustment factor, then an aggregation of transactions will be necessary to develop this factor, which would then be applied against the total assessment of each data collection zone in the aggregation (in some cases such an aggregation may even be as large as a ward). Since it cannot be predicted beforehand which data collection zones will have a deficiency of property

transactions the aggregation process cannot be performed until the actual transactions which have taken place become known.

2. Land Use

a) Procedure for Determining the Pattern of Land Use

- Superimpose the data collection zones in the "914" series falling in the rail corridor, onto a land use map. Land use maps are available for the entire rail corridor with the exception of the Burlington and Hamilton catchment area. (see section - Form and Content of Municipal records).
- With the use of a planimeter, measure the area in each land use category (i.e. Residential, Commercial, Industrial etc.)

b) Procedure for Estimating the Intensity of Land Use

- 1) Estimating the assessed value of building per acre for each data collection zone.
 - Establish the assessment roll numbers of the properties contained in each data collection zone (this will have been done as a preliminary step in estimating the market value of real estate in each data collection zone).
 - Using the assessment roll add up the assessed value of buildings for each property in the data collection zone.

1. The first part of the report is devoted to a general survey of the situation in the country.

2. The second part of the report is devoted to a detailed analysis of the economic situation.

3. The third part of the report is devoted to a detailed analysis of the social situation.

4. The fourth part of the report is devoted to a detailed analysis of the political situation.

5. The fifth part of the report is devoted to a detailed analysis of the cultural situation.

6. The sixth part of the report is devoted to a detailed analysis of the scientific situation.

7. The seventh part of the report is devoted to a detailed analysis of the educational situation.

8. The eighth part of the report is devoted to a detailed analysis of the health situation.

9. The ninth part of the report is devoted to a detailed analysis of the environmental situation.

10. The tenth part of the report is devoted to a detailed analysis of the international situation.

11. The eleventh part of the report is devoted to a detailed analysis of the foreign trade situation.

12. The twelfth part of the report is devoted to a detailed analysis of the tourism situation.

13. The thirteenth part of the report is devoted to a detailed analysis of the sports situation.

14. The fourteenth part of the report is devoted to a detailed analysis of the leisure situation.

15. The fifteenth part of the report is devoted to a detailed analysis of the housing situation.

16. The sixteenth part of the report is devoted to a detailed analysis of the transport situation.

17. The seventeenth part of the report is devoted to a detailed analysis of the communication situation.

18. The eighteenth part of the report is devoted to a detailed analysis of the energy situation.

19. The nineteenth part of the report is devoted to a detailed analysis of the water situation.

20. The twentieth part of the report is devoted to a detailed analysis of the land situation.

- At the same time add up the acreages for each property in the data collection zone.
 - Calculate the average value of buildings per acre in the data collection zone.
- 11) Estimating the population per acre involves the same steps as above except that step (b) would consist of adding up the number of residents for each property in the data collection zone. A suggested worksheet format for performing these steps is contained in Exhibit 7.

With regard to collecting building permit data, this involves transcribing the volume and value data onto a worksheet and then re-arranging this data into "914" data collection zones using a property identification index. Exhibit 8 represents a worksheet that might be used to perform this operation.

3. Household Characteristics

The data sources for estimating the pattern of household characteristics in each data collection zone will be the assessment rolls and population statistics for each municipality. (It will be recalled that entries in both of these documents are identified by common assessment roll numbers for reference purposes). Because of the large number of entries in these two sources (Oakville has 20,000 entries for an average of 250 per data collection zone), it is recommended that household characteristics be estimated on a sampling basis rather than 100% enumeration. Based on this recommendation the following would be the steps for gathering data on household characteristics.

- a) Establish the assessment roll numbers of properties contained in each data collection zone.
- b) Assign a consecutive number consistent with a random numbers table to each assessment roll number.
- c) Using a random number table draw a sample of entries from the assessment roll and population statistics.

Exhibit 9 represents a worksheet that might be used to perform these steps.

With regard to the size of the sample which should be drawn, this will depend on the degree of precision deemed necessary (i.e. the range of values within which all of a particular measured household characteristic would be expected to fall at a certain probability level).

PLAN FOR EXECUTING
THE DATA COLLECTION
PROGRAM

(i.e. for assessing the impact of the Lakeshore Communter Rail Service on real estate values and land use).

1. INTRODUCTION

The physical process of conducting the Data Collection Program falls into three parts as follows:

- a) Determining the data collection zone that each lot and plan number falls into (i.e. preparing a property identification index).
- b) Translating the lot and plan numbers for each data collection zone into assessment roll numbers (i.e. establishing where the information pertaining to the lots that make up a data collection zone is located in the assessment roll.)
- c) Gathering the necessary data. Steps a and b "preparation" steps which must be performed before proceeding to Step c.

2. TIME TABLE

Because it's unlikely that the impact of the Commuter Rail Service will be of measurable proportions for at least two years after commencement of the Service, it is recommended that during the first two years, the two "preparation" steps mentioned above be completed. The actual "data gathering" should begin at that point in time when it is established that the impact of the Commuter Rail Service is measurable. It has been suggested by Mr. J.I.Stewart of the Division of Town and Regional Planning, School of Architecture, University of Toronto, that this might be done by taking a small sample of about 100 observations from two municipalities within the influence of the Commuter Rail Service, one in the eastern and one in the western rail corridor. These observations would consist of data relating to real estate values and land use (as detailed in the Data Collection Program) and would be compared against similar data drawn from two reference periods; a) a period prior to the announcement of the Commuter Rail Service and b) the period between the announcement and actual

commencement of the service. (Interpretation of change in real estate values and land use should be performed by someone fully aware of all the forces that may have had an influence on these two items. Any conclusions drawn should then be confirmed by someone on the planning and or assessment staff of the municipalities being studied).

3. FIELD WORK

It will be possible to perform the first preparation step, that of developing a property identification index, in the MTARTS headquarters since all the necessary information will be available from the lot and plan maps supplied by the municipality. However, translating lot and plan numbers into assessment roll numbers and the actual data gathering step will involve field work since the necessary information sources are located right in the municipality and cannot be removed.

4. TIME REQUIREMENTS

Probably the single most important factor governing the time involved in performing the two preparation steps in this program, is the length of each sequence of lot and plan numbers making up a data collection zone. Because individual building lots in any registered plan are normally numbered consecutively beginning at 1, it will be found that the lot and plan numbers for a particular data collection zone can most often be expressed in terms of sequence or groups of numbers rather than individually. As a result, the larger these sequences are, the fewer will be the number of sequences comprising a data collection zone and the faster will be the process of determining the lot and plan numbers making up data collection zone.

In light of the above, it is extremely difficult to make a very precise estimate as to the amount of time required to execute the Data Collection Program for the following reasons:

- a) No investigation has yet been conducted to determining the degree to which the boundaries of sub-division plans in each municipality transverse data collection zone boundaries. The cutting of boundaries significantly slows down the "preparation" process because it causes breaks in the sequence of lot and plan numbers and thus increases the number of sequences making up a data collection zone.

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- b) No investigation has yet been conducted to assess the sizes of subdivision plans in each municipality. The larger such plans are, then the longer will be the sequence of lot and plan numbers comprising the data collection zone.

However a limited time study was conducted to determine the amount of time involved in assembling a property identification index and using this information together with a certain amount of judgment it would appear that 900 man hours would be involved in doing the preparation steps for all the municipalities directly affected by the Commuter Rail Service (with the exception of Hamilton, Burlington and Oakville which will be explained in the following).

5. SPECIFIC DATA COLLECTION PROCEDURE

The following is suggested as a plan for executing the Data Collection Program. Specific procedures are detailed in R.A. Robinson's document "Assessing the Impact of the Lakeshore Commuter Rail Service in Real Estate Values and Land Use."

- a) Conduct the "preparation" steps beginning the summer of 1967 in all municipalities along the Commuter Rail Corridor with the exception of:
 - i) Hamilton and Burlington - where it is expected that the impact of the Commuter Rail Service will be limited.
 - ii) Oakville -- which already has a special index for internal use by its assessment giving essentially the same information as would be obtained in the "preparation" steps.
- b) Since the basic data sources involved under the Data Collection Program will always be located in municipal offices, a letter from a high ranking member of MTARTS (or its future equivalent), or possibly even a minister, should be directed to the appropriate people in each municipality (i.e. the assessment commissioner, the planning commissioner, the clerk) requesting their cooperation in releasing information.
- c) Because it is expected that some judgment will be required and because frequent interaction with municipal staff members will be involved, it is recommended that the preparation steps be performed by summer university students. Based on the time requirements discussed above it would appear that

c) cont'd

two university students could make up a team and perform the necessary operations in a maximum of two summers. A team effort is recommended in the interest of work efficiency since one person can read off information from municipal records and the other person can record it.

- d) In order to gain a familiarity with actual problems involved in field work and to develop efficient work procedures, a smaller municipality such as Long Branch, should first be contacted. Once all the "preparation" work has been completed in this municipality work should continue along the corridor to Scarboro and on to the next largest municipality. The same sequence of municipal coverage should be used for "data gathering".
- e) Because the "data gathering" step is expected to be of a very routine nature once the preparation steps have been completed, competent clerical staff can probably be entrusted with performing this part of the Data Collection Program.
- f) As a control over the activities of the people who physically perform the preparation and data gathering steps, particularly when field work is involved, one member of each work team should be designated as work leader responsible to a supervisor who is a permanent staff members of MTARTS. Periodic audits of work accuracy should be performed by the supervisor and the people doing the work should be advised that such audits will be taking place from time to time.

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The first part of the report
 deals with the general situation
 and the results of the survey.
 The second part contains the
 detailed description of the
 various types of plants and
 animals found in the area.
 The third part discusses the
 distribution of the different
 species and the factors which
 influence their growth and
 development. The fourth part
 deals with the conservation
 of the natural resources and
 the measures which should be
 taken to protect them. The
 fifth part contains the
 conclusions of the study and
 the recommendations for further
 research.

